XTE OBSERVATIONS OF INTERMEDIATE POLARS: RXTE TOO OBSERVATIONS OF SUPERNOVAE

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Principal Investigator
Dr. E. Schlegel

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Smithsonian Institution
Astrophysical Observatory
Cambridge, Massachusetts 02138

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The NASA Technical Officer for this grant is Jean Swank, Code 662.0, NASA/Goddard Space Flight Center, Greenbelt, MD 20771.

The listed titles are essentially two separate projects merged into one grant. Each is described separately.

Two intermediate polar cataclysmic variables, PQ Gem and AO Psc were observed jointly with RXTE and ground-based photometry. The analysis of IPs is complex because these objects exhibit light curves that behave differently as a function of energy and that behave differently when phased on the orbital or on the spin periods. The presence of two periods in one system is essentially equivalent to analyzing two different X-ray sources.

A preliminary analysis of the PQ Gem data was carried out and presented at the Annapolis Workshop on Magnetic Cataclysmic Variables. The final analysis of the data were held up by problems with the background estimation. The RXTE PCA team has released a new version of the background estimator. The PQ Gem must be re-analyzed using the new background. We have also installed a spectral model that calculates the expected emission from an accretion column. That model is undergoing final testing before we apply it to the data.

The PQ Gem 2-10 keV observation shows a deep dip in the light curve that is present from the lowest channels (about 2 keV) to about 6 keV. Previous observations have shown that above 2 keV, the dip is not present. We intend to accumulate spectral data within the dip to compare it with the spectrum at non-dip phases.

The data on AO Psc have been dissected, but suffer from the same background and model fitting problems as the PQ Gem data.

The proper model to fit the spectra of these two IPs is an integrated accretion column model. The PI has obtained a copy of the code from one of its authors (M. Cropper, Mullard Space Sciences Laboratory, UK) and that code is undergoing testing. Once it is available, the spectra can be re-fit and the paper written.

Recently, optical observations have been made available that were obtained contemporaneously with the X-ray data. The combination of the two data sets creates a scientifically more productive result than the individual data sets. We are working to combine the data.

A Target of Opportunity observation was obtained of the supernova SN1996cb in January 1997. The data have been hostage to the background subtraction problem for faint sources. With the new background estimator, these data can be re-analyzed.

The PI has an escalating series of commitments to the Chandra Observatory Science Center that reduces the amount of time available to devote to the project.